URINARY BIOMARKERS OF EXPOSURE TO GLYCOL ETHERS AND ADVERSE PREGNANCY OUTCOMES

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Background and aims : Glycol ethers (GE) are widely used solvents present in various products such as paints, cleaning agents or cosmetics. GEs toxic effects are attributed to the production of alkoxycarboxylic acids, some of them are known developmental toxicants (MAA and EAA) or embryotoxic (BAA) in animals. The aim of our study was to test the association between levels of alkoxycarboxylic acids and the occurrence of adverse pregnancy outcomes.

Methods : The PELAGIE birth cohort included 3,421 pregnant women before 19 weeks of gestation between 2002 and 2006. At inclusion, women provided a urine sample. Urinary levels of 8 alkoxycarboxylic acids were assessed by chromatography (LOD=0.05mg/L) in a nested case-control study comparing 174 cases of fetal growth restriction, 111 preterm births, and 505 controls, odds ratios (OR) were estimated using logistic models adjusted for potential confounders. The study of the association with birth weight and gestation length was restricted to controls using linear regression models.

Results : The percentage of samples in which alkoxycarboxylic acids were identified ranged from 4.4% for EAA to 71.5% for BAA (metabolite of EGBE, present in cleaning products) and 91.3% for PhAA (metabolite of EGPhE, present in cosmetics). Frequently detected BAA and PhAA were not asssociated with fetal growth. EEA was the only metabolite showing an association with fetal growth restriction (OR =2.17 95% CI : 1.0-4.8) and birth weight decrease (b= - 193.1 g; p=0.02). No association was seen with preterm birth or gestation length.

Conclusions : Frequently detected alkoxycarboxylic acids in pregnant women (BAA and PhAA) are not associated with growth restriction. EAA, a known developmental toxicant in animals, is the only GE metabolite associated with fetal growth restriction in our study.